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| 10/065,450      | 10/18/2002  | Thomas L. Toth       | GEMS8081.138        | 1346             |

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EXAMINER

SHAW, SHAWNA JEANNINE

ART UNIT PAPER NUMBER

3737

DATE MAILED: 08/16/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

10/065,450

Applicant(s)

TOTH ET AL.

Examiner

Shawna J. Shaw

Art Unit

3737

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 18 October 2002 and 23 October 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 18-30 and 38-56 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 18-30, 38-46 and 50-56 is/are rejected.
- 7) ☒ Claim(s) 47-49 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 18 October 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_

- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Claim Objections***

1. Claims 18, 28, 38 and 41, are objected to because of the following informalities:  
In claims 18 and 38, the connection between the step of determining a helical artifact index and the preceding steps is unclear – for example, how does the HAI follow from the comparing step? Claim 38 is directed to a method for generating a helical artifact score, however steps for generating such a score have not been set forth. Claims 28 and 41 stating that pixels are identified within a range of “+/- 40 CT numbers” is consistent only if the imaging device is a CT scanner and would be inconsistent with another type of imaging device. Appropriate correction is required.

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2. Claims 38-56 are rejected under 35 U.S.C. 112, first paragraph, as based on a disclosure which is not enabling. A method for generating a helical artifact index without a phantom and a CT scanner (as later set forth in dependent claims 55 and 56) which is critical or essential to the practice of the invention, but not included in the claim(s) is not enabled by the disclosure. See *In re Mayhew*, 527 F.2d 1229, 188 USPQ 356 (CCPA 1976). The specification sets forth determining a helical artifact index (HAI) based on acquiring and processing image data of a phantom [0006], [0023] and that *helical*

artifacts arise from patient translation in a z direction during gantry rotation [0002]. MRI, PET and ultrasound imaging systems do not have rotatable gantries.

3. Claim 19 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. The specification does not adequately teach how to determine or use a *helical* artifact index for MRI, PET or ultrasound scanners.

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 38-40, 42-46, 50, 53, 56 are rejected under 35 U.S.C. 102(b) as being anticipated by Hsieh '896.

Hsieh teaches methods and software for obtaining a helical artifact index comprised of a ratio, or comparison, of a first set of image data with helical weighting ("mask") with a second set of image data without helical weighting. See col. 5 lines 6-27 and 51-53. Hsieh also teaches processing the weighted image data to obtain 3D MIP images by assigning maximum pixel, or base, values (col. 2 lines 5-12). Hsieh additionally discloses a 3x3 filter and a display (col. 3 lines 65-67). Furthermore, the standard deviation of Hsieh inherently involves the steps of claims 43-46.

***Claim Rejections - 35 USC § 103***

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 18-27, 29 and 55 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hsieh '896 as applied to claims 38-46 above in view of Toth et al. '487.

Regarding claims 18-27, 29 and 55, Hsieh differs from the claimed invention in that a phantom is not addressed. Toth et al. generally teaches the use of a phantom for calibrating CT scan data (col. 3 line 58 – col. 4 line 5). It would have been obvious at the time the invention was made to a person of ordinary skill in the art to use a phantom as taught by Toth et al. in the invention as taught by Hsieh to correct for noise specifically attributed to helical scanning (cp. Hsieh col. 2 lines 18-29) without the

complication of motion artifacts and non-symmetrical objects (Toth col. 2 lines 48-54) contributed by human scanning so as to allow for more focused and appropriate correction/calibration of helical noise.

6. Claims 41 and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hsieh '896, and Hsieh '896 in view of Toth et al. '487, respectively.

Hsieh '896 does not specifically address imaging values within  $\pm 40$  CT numbers of an expected value. At the time the invention was made, it would have been an obvious matter of design choice to a person of ordinary skill in the art to image values within  $\pm 40$  CT numbers of an expected value because Applicant has not disclosed that a range of  $\pm 40$  CT numbers provides an advantage, is used for a particular purpose, or solves a stated problem. One of ordinary skill in the art, furthermore, would have expected Applicant's invention to perform equally well with the standard deviation distribution of Hsieh because both perform the same function of limiting relevant imaging data to features of interest.

7. Claims 51 and 52, are rejected under 35 U.S.C. 103(a) as being unpatentable over Hsieh '896.

Hsieh '896 differs from the claimed invention in that a 5x5 filter kernel and/or a Hanning kernel are not specifically addressed. At the time the invention was made, it would have been an obvious matter of design choice to a person of ordinary skill in the art to use a 5x5 filter array or a Hanning kernel because Applicant has not disclosed that a 5x5 filter array or a Hanning kernel provide an advantage, are used for a particular purpose, or solve a stated problem. One of ordinary skill in the art,

furthermore, would have expected Applicant's invention to perform equally well with the 3x3 filter kernel of Hsieh '896 because all perform the same function of data smoothing.

8. Claim 30 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hsieh '896 in view of Toth et al. '487 as applied to claim 18 above and further in view of Gordon et al. '828.

Regarding claim 30, Hsieh differs from the claimed invention in that displaying an artifact index in the form of a histogram is not specifically addressed. Gordon et al. generally teaches that it is known to display CT error/calibration data in the form of a histogram for minimizing subsequent scan errors (fig. 4A-C, col. 2 line 36 – col. 3 line 4 and claim 1). It would have been obvious at the time the invention was made to a person of ordinary skill in the art to display the helical error/calibration data of Hsieh '896 in view of Toth et al. in the form of a histogram as taught by Gordon et al. to easily and/or automatically identify projection errors.

#### ***Allowable Subject Matter***


9. Claims 47-49 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

#### ***Conclusion***

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shawna J. Shaw whose telephone number is (703) 308-2985. The examiner can normally be reached on 8:00 a.m. - 4:30 p.m..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dennis Ruhl can be reached on (703) 308-2262. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Shawna J. Shaw  
Primary Examiner  
07/08/2004